

## **REMARKS**

### **Status of Claims**

The Office Action mailed November 17, 2004 has been reviewed and the comments of the Patent and Trademark Office have been considered. Claims 1-23 remain pending in the application with none of the claims being amended in this reply. Applicants respectfully request reconsideration because it is believed to place the application in condition for allowance.

### **Prior Art Rejections**

In the Office Action, claims 1-10, 12-20, 22, and 23 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent 6,330,556 to Chilimbi et al. (hereafter "Chilimbi"). Claims 11 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chilimbi in view of U.S. patent 5,675,790 to Walls (hereafter "Walls"). Applicants respectfully traverse these rejections for at least the following reasons.

Applicants believe that each of the pending independent claims 1, 13, and 23 are patentable for at least the same reasons as presented in the amendment and reply filed on August 10, 2004, and those reasons are incorporated by reference herein. As discussed in the earlier amendment, each of the independent claims relate to *code* caches, that is caches which store program code during execution of a *dynamic instruction translator*. Each of these independent claims recite a method, system, and software for operating a *code cache* in a *dynamic instruction translator* that (1) stores a plurality of *instructions* (of the dynamic instruction translator) in a cold partition of a cache memory; (2) determines whether an *instruction* translation stored in the cold partition is hot; and (3) moves the determined hot *instruction* to a hot partition of the cache memory. These recited features are not disclosed or suggested by the prior art for all the reasons presented in the amendment and reply filed on August 10, 2004.

### **Rebuttal of assertions in the Office Action**

With respect to the assertions in paragraph (5) of the Office Action, applicants respond as follows with the sub-paragraphs numbered below referring to the identically numbered sub-paragraphs in paragraph (5) of the Office Action.

(1) The Office Action essentially acknowledges that Chilimbi does not disclose a code cache in which instructions are moved from a cold partition to a hot partition of the code cache. The Office Action then states Chilimbi discloses that a compiler accomplishes a partition of data in a data cache and states that this disclosure is equivalent to the claimed code cache. This assertion is incorrect for at least the following two reasons. *First*, one skilled in the computer science art would recognize that the claimed invention is directed to a dynamic instruction translator which operates very differently than a compiler (which partitions *data*) disclosed by Chilimbi. In a compiler, source code is compiled into executable code which accesses the data when the executable code is executed. Therefore, at run time, code has already been optimized for execution and only the data access is improved through better data access in a cache. In sharp contrast, the claimed invention seeks to improve the performance of a dynamic instruction translator for which the claimed code cache is utilized. In other words, Chilimbi's use of compiler (for partitioning data accessed by the code) teaches away from the claimed invention. The office actions use of Chilimbi in this context to teach the claimed invention requires an impermissible change in principle of operation of the Chilimbi disclosure.

Furthermore, the Office Action conclusorily states that "[u]sing a cache to store instruction translations as opposed to another type of *data* does not distinguish the instant application over the applied art." One skilled in the computer science art would recognize that computer instructions or code is fundamentally very different in character than "data" that is used by the instructions or code. Such an interchangeability asserted by the examiner is inconsistent with the understanding of those skilled in the art. In fact, Chilimbi is explicitly directed to splitting only "data" elements (and not code elements). For example, even in the context of classes, Chilimbi explicitly states that the term "classes" (as used in the splits) "refer to data structures where the in memory organization of the data is left to the language implementer." (Emphasis added). See col. 10, lines 47-50 of Chilimbi.

Furthermore, as discussed with respect to sub-paragraph 2 below, the caching considerations that underlie code caches differ from that for data caches and this provides another reason why the Office Action's assertion that Chilimbi's disclosure of partitioning data in data caches is equivalent to the claimed code cache is incorrect.

(2) The Office Action asserts that the different considerations that underlie code caches from data caches “are not recited in the rejected claims.” While this is *prima facie* correct, these considerations provide powerful reasons why the data cache features (disclosed by Chilimbi) do not teach or suggest claimed code cache features as implied in the Office Action. Therefore, the features related to code caches are not obvious based on the features of the data caches disclosed by Chilimbi. The only teachings related to the claimed caches is provided by the applicants’ disclosure. If the examiner is to maintain this obviousness rejection based on the impermissible use of the applicants’ own disclosure, the examiner is respectfully requested to provide a reference that shows this equivalence (between code and data caches) asserted in the Office Action.

(3) The Office Action’s assertion that data *or instructions* may be split in some way is incorrect. While Chilimbi discloses splitting the fields of a data structure, the claimed invention recites moving instructions from a cold partition to a hot partition of a code cache (and not of splitting an instruction itself in the manner of splitting a data structure suggested by Chilimbi). In fact, this provides another difference between the considerations that underlie the claimed code cache from the data caches disclosed by Chilimbi and provides another objective reason why the data cache features of Chilimbi do not disclose or suggest the claimed code cache.

In view of the above reasons, applicants submit that Chilimbi does not disclose or suggest the features recited in pending independent claims. Furthermore, the deficiencies of Chilimbi are not cured by any of the other applied references. Therefore, the Office Action fails to make a *prima facie* case of obviousness with respect to the pending independent claims. Accordingly, the applied rejections should be withdrawn.

The dependent claims are also patentable for at least the same reasons as the independent claims on which they ultimately depend. In addition, they recite additional patentable features when considered as a whole.

### **Conclusion**

In view of the above, applicants believe that the application is now in condition for allowance. An indication of the same is respectfully requested. If there are any questions regarding the application, or if an examiner’s amendment would facilitate the allowance of

one or more of the claims, the examiner is invited to contact the undersigned attorney at the local telephone number below.

Respectfully submitted,

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Date

Aaron C. Chatterjee

William T. Ellis  
Reg. No. 26,874

Aaron C. Chatterjee  
Reg. No. 41,398